

ABSTRACT

A method for manufacturing a MOSFET equipped with a silicide layer over shallow source and drain junctions without leakage generation is provided. By restricting the temperature of manufacturing steps after the silicide formation below a critical temperature  $T_c$ , which is defined below as a function of a junction depth  $D_j$  from 20 nm to 60 nm, leakage generation is practically suppressed.

$$T_c = a \times D_j + b,$$

where  $a = 6.11$  ( $20 < D_j \leq 26$ )  
 $= 1.60$  ( $26 < D_j \leq 60$ ),  
 $b = 290.74$  ( $20 < D_j \leq 26$ )  
 $= 408$  ( $26 < D_j \leq 60$ ),

$D_j$  is a junction depth (nm) measured from the lower surface of the silicide layer, and  $T_c$  is a critical temperature ( $^{\circ}\text{C}$ ) during a heat treatment.